

### **REMARKS**

This is in full and timely response to the Final Office Action dated November 7, 2006. A Petition for a One Month Extension of Time is filed concurrently herewith. The present Amendment amends claim 1. Support for this amendment can be found variously throughout the specification, including, for example, original claim 1 as filed. No new matter has been added.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) does not raise any new issues requiring further search and/or consideration; (c) satisfies a requirement of form asserted in the previous Office Action; and (d) places the application in better form for appeal, should an appeal be necessary. The amendment is necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of this amendment is respectfully requested. Reexamination and reconsideration in light of the above amendments and the following remarks are respectfully requested.

#### **Claim Rejections- 35 U.S.C. § 112**

In the Action, claims 1-5 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. Applicant respectfully traverses this rejection. However, in order to expedite prosecution, claim 1 has been amended to remove the phrase "one or more groups." Additionally, support for a "carboxyl" group can be found variously throughout the specification, including, for example, page 3, line 7 through page 4, line 2 and Example 24. Withdrawal of this rejection is therefore courteously solicited.

#### **Claim Rejections- 35 U.S.C. § 103**

In the Action, claims 1-5 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over European Patent No. 0 146 374 to Venturello et al. ("Venturello") in view of U.S. Patent No. 2,813,908 to Young ("Young") or British Patent No. GB 1 208 144. This rejection is respectfully traversed for at least the following reasons.

Claim 1 discloses, *inter alia*, A method for producing a 1,2-diol compound comprising the steps of reacting an olefin compound **with hydrogen peroxide in the presence of a polymer compound having a sulfonic acid group** to obtain the 1,2-diol compound.

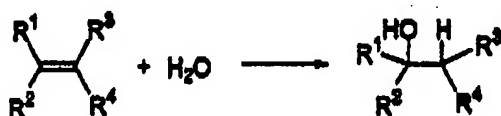
In contrast, while Venturello arguably discloses a method for producing vicinal diol using olefin and  $H_2O_2$  in the presence of a catalyst, Venturello fails to disclose, teach, or even suggest the use of a polymer catalyst having a sulfonic acid group (*see Venturello at the Abstract*). Rather, Venturello discloses the use of heteropoly acid derivatives of tungsten (W) as the catalyst(s) for the reaction (*see Venturello at page 8, lines 15-20 and claim 1*).

The Examiner is of the opinion that, although Venturello fails to even suggest the use of a polymer catalyst having a sulfonic acid group, it would nonetheless have been obvious to combine the olefin reaction of Venturello with either of the hydration methods of Young or GB 1 208 144 to arrive at the presently claimed invention. However, as shown below, the diol forming reaction disclosed by Venturello differs significantly from the monohydroxyl alcohol forming reactions disclosed by Young and GB 1 208 144, and there is no reasonable basis to conclude that one skilled in the art would be motivated to combine the disparate processes to arrive at the presently claimed method.

Venturello, discloses a process of using reacting olefin and  $H_2O_2$  **in the presence of a heteropoly acid derivative of tungsten as a catalyst**. The full reaction of Venturello first produces an epoxy compound, which is further reacted with water to predictably form the resulting diol as shown:



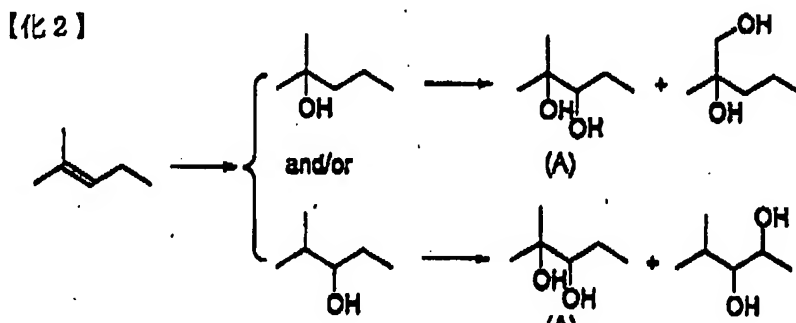
In contrast to Venturello, Young and GB 1 208 144 each disclose a method of making a monohydroxyl alcohol and ether based on hydration of an olefin in the presence of water and a sulfonated resinous copolymer. The olefin hydration of both Young and GB 1 208 144 can be expressed as follows:



Young states "this invention relates to the production of alcohols and ethers by the direct hydration of the lower olefins such as ethylene, propylene, and n-butylenes" (see *Young at column 1, lines 14-16*). GB 1 208 144 states that "the invention relates to a process for the production of alcohols and ethers by the direct addition of water to lower olefins" (see *GB 1 208 144 at page 1, left column, lines 9-11*).

Based on the monohydroxyl alcohol obtained by the reaction product of Young and GB 1 208 144, one would need to add an additional hydroxyl group to obtain a diol. Neither Young nor GB 1 208 144 discloses such a diol forming reaction.

However, the following example illustrates the process of first forming a monohydroxyl alcohol from an olefin, which monohydroxyl alcohol is then separately reacted through various other known means to produce a diol:



It is easy to see that the reaction methods of Young and GB 1 208 144, which are used to produce a monohydroxyl alcohol, would result in the formation of a very unpredictable diol if used in such a diol forming reaction. The process disclosed by Venturello differs greatly from the process

of Young and GB 1 208 144, as shown above. The resulting diol products of Venturello are highly predictable, while the monohydroxyl products of Young and GB 1 208 144 are unpredictable, especially if one were to include a step of reacting the monohydroxyl alcohol product to form a diol as illustrated.

Note, the above illustrations are provided for the Examiner's convenience, and are merely illustrative of the differences between the diol forming reaction of Venturello and the monohydroxyl alcohol forming reaction of Young and GB 1 208 144.

Caselaw recognizes and supports the assertion that the chemical arts are highly unpredictable. *see, e.g., In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970) (contrasting mechanical and electrical elements with chemical reactions and physiological activity). See also *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); *In re Vaeck*, 947 F.2d 488, 496, 20 USPQ2d 1438, 1445 (Fed. Cir. 1991).

Therefore, it is improper to draw unsupported conclusions concerning the obviousness of combining distinct reactions. To do so constitutes impermissible hindsight reconstruction. One "cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *Ecolochem, Inc. v. Southern Cal. Edison Co.*, 227 F.3d 1361, 1371, 56 USPQ2d 1065 (Fed. Cir. 2000) (citing *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1780, 1783 (Fed. Cir. 1988)). Indeed, "[c]ombining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight." *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Accordingly, the Examiner must provide adequate support for the assertion that one skilled in the art would be motivated to use the sulfonated resin catalyst utilized in the monohydroxyl alcohol forming reaction of Young and GB 1 208 144, which reaction is carried out in the presence of water, in place of the tungsten derived catalyst utilized in Venturello, which reaction is carried out in the presence of H<sub>2</sub>O<sub>2</sub>. Instead of providing support for his assertion of motivation in the Final Office Action, the Examiner makes the following statements concerning the cited art: "It was known in the art at the time the claimed invention was made that the preparation of diols requires

hydrogenation of olefins in the presence [of] hydrogen peroxide and a catalyst as disclosed by Venturello et al. It was also well known in the art at the time the present invention was made that polymers having sulfonic groups are very useful as catalysts in the hydration of olefins as disclosed by Young and the British Patent '144. Thus [Young] and the British Patent '144 provide a motivation for use of polymers having sulfonic acid groups as catalysts in the hydration of olefins" (see pages 2 and 3 of the Final Office Action).

While the Examiner arguably provides evidence that the diol forming process of Venturello was known and that the monohydroxyl alcohol forming process of Young and GB 1 208 144 was well known, **the Examiner has failed to show the motivation to combine the two differing reaction processes to arrive at the presently claimed method.** In contrast to the Examiner's assertion, **one skilled in the art would not have an expectation of success in combining the very distinct processes which each are used in the art to obtain very distinct products.** One would not be lead to expect success when using a catalyst disclosed by Young and GB 1 208 144, which is used in the presence of a water reagent, in the reaction of Venturello, which is carried out in the presence of an H<sub>2</sub>O<sub>2</sub> reagent. See, e.g., *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); accord. MPEP 2143.01 ("If [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification"); accord. MPEP 2143.01. As established by the federal courts, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. See, e.g., *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959); accord. MPEP 2143.01.

In conclusion, Applicant believes the arguments in the Final Office Action in regards to the cited references constitutes hindsight reconstruction, since the motivation to combine the cited references to arrive at the claimed invention is not derived from the teachings and suggestions of the cited references themselves, but instead is derived from Applicant's own disclosure. Hence, the alleged combination of references is clearly the result of hindsight reconstruction based on the teachings of the present application. When determining obviousness under 35 U.S.C. §103, the references must be viewed without the benefit of impermissible hindsight vision afforded by the

claimed invention. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143, 229 USPQ 182, 187 (Fed. Cir. 1986).

Accordingly, for the above reasons, a *prima facie* case of obviousness has not been established, and withdrawal of this rejection is respectfully requested. *See, e.g., In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); *accord.* MPEP 2143.03.

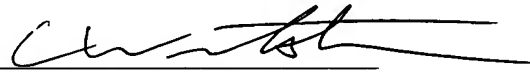
**CONCLUSION**

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. SAE-0027 from which the undersigned is authorized to draw.

Dated: March 7, 2007

Respectfully submitted,

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